

The Göteborg discothèque fire, 1998

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Dyregrov, A., Frykholm, A.-M., Lilled, L., Broberg, A. G. & Holmberg, I. (2003). The Göteborg discothèque fire, 1998. *Scandinavian Journal of Psychology*, 44, 449–457.

Findings from a study of 563 adolescents' reactions following a discotheque fire that killed 63 young people in Göteborg in October 1998 are presented. The group answered a questionnaire seven months following the disaster. The questionnaire included the Impact of Event Scale (IES) and the Birleson Depression Self-Rating Scale (DSRS). The level of trauma was found to be very high, while depression scores were less elevated. A little under a third of the students scored above a clinical cut-off point (> 35) on the IES, indicating high posttraumatic stress levels. Girls evidenced more depression and traumatic stress reactions than boys. Levels of reactions increased with more closeness (knowing victims personally) and if the adolescents were of non-Swedish origin.

Key words: Disaster, adolescents, Impact of Event Scale, Birleson Depression Self-Rating Scale.

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INTRODUCTION

*The event*¹

Three hundred and ninety-nine people were inside a two-storey building, gathered at a discothèque party, in Göteborg, when a fire erupted just before midnight on Thursday 29 October 1998. The fire inspector had agreed to allow 150 people in the building, with regard to the emergency exits' position and width. The room used was on the second floor of the building, with the entrance located at one end and the dance floor and emergency exits at the other.

The fire started in the corridor behind the emergency exit and had lasted 20–60 minutes before it penetrated to the room. The smoke fumes ignited and fire quickly blasted through the room. This started a rush, but as the room narrowed at the entrance, people got squeezed together, started to fall and fastened in the exit door. A hundred youngsters were trapped in the room with no other exit other than through windows 10 feet above the floor. Horrible experiences took place inside and outside the building. A combination of lack of trust of the authorities before the disaster and an altered perception of time, with an experience that it took "forever" for rescuers to respond to this disaster, led to high dissatisfaction with the rescuers.

A total of 63 people were killed and 213 others were treated at different hospitals, many of them severely injured and requiring care at specialty units. The dead were aged between 12 and 19 years, and came from 19 different nations. Survivors were exposed to extreme sensory impressions. Parents and friends experienced a tremendous amount of

stress while waiting outside or searching through different hospitals to learn whether their loved ones had died or survived. As news of the event spread, many young people gathered outside the building and were exposed to the situation and the grief and misery of others (including bereaved people). For several days and weeks, many young people gathered at the disaster site to place flowers, pictures, poems, candles and other memorabilia to ritualize their grief and talk about their lost friends. Throughout the first weeks, the media coverage was enormous, with interviews of survivors and bereaved alike, as well as a search for scapegoats. Late in 1999, the prosecutor's office arrested four young adults for arson. The four had been asked to leave the party. They were sentenced to prison for three to eight years.

Crisis intervention

A massive crisis intervention was instigated at the various hospitals that received dead and injured youths. The different child and adolescents outpatient clinics throughout Göteborg used about 2200 working hours during the first 14 days (Schütz, 1999). In addition, most schools set in action their crisis contingency plans, offering a variety of different services or activities to help the students. For those who were injured, a variety of services were available at the different hospitals that took part in the medical follow-up.

The different municipalities within the city, churches and voluntary organizations established about 60 different crisis centres throughout the city. Although the immediate response was rapid and comprehensive, the follow-up of the many people involved has been more problematic. Within

the psychiatric services, the tradition for outreach was limited, and adolescents rarely sought out psychiatric facilities on their own. When traditional services were sought out, some help-seekers dropped out following the first visit, as they found that the services provided were not helpful. Within the school system, the response varied enormously. While some schools had a management well aware of the needs of the students, other principals saw it as their role to have their school return to normal (i.e. stop devoting time to the disaster and its consequences) after the first acute interventions. The overall aim of the study is to look at how an event of this magnitude influenced students throughout the city of Göteborg.

Relevant previous studies

It is hard to find comparable events for this disaster, which was triggered by a deliberate malicious human act. Terrorist attacks and wartime events are more similar to this event than natural disasters and large accidents. Following terrorist attacks like the Oklahoma bombing (Pfefferbaum *et al.*, 2000) and war situations (Ahmad, Mohamed & Ameen, 1998; Dyregrov, Gupta, Gjestad & Mukanoheli, 2000) children and adolescents react with posttraumatic stress symptoms. Reactions are not only short-term, but continue over time (Dyregrov, Gjestad & Raundalen, 2002).

It is not only those in close proximity to danger who are at risk of experiencing reactions over time. Certain disasters, especially disasters that receive intense media coverage, can affect children and adolescents far removed from the scene of events, even across a whole nation, as Terr *et al.* (1997) have shown following the explosion of the space shuttle *Challenger* in 1986. Terr *et al.* (1999) use the term "distant trauma" to describe the experience of a disastrous event from a safe distance. When a community suffers a disaster, widespread effects can be found among students throughout a district, as following the 1995 Oklahoma City bombing (Pfefferbaum *et al.*, 1999). When close personal consequences may be relatively limited, Pfefferbaum *et al.* found the media played a role in sustaining posttraumatic stress symptoms. Following the Oklahoma bombing, those who lost a friend had significantly more posttraumatic stress symptoms than those who lost an acquaintance (Pfefferbaum *et al.*, 2000). Also, among children with no physical or emotional exposure, the degree of television exposure was directly related to posttraumatic stress symptomatology (Pfefferbaum *et al.*, 2001). Pynoos, Frederick *et al.* (1987), in their study of students in a school following a sniper attack, showed a positive correlation between symptoms of posttraumatic stress disorder (PTSD) and level of acquaintance with the child who was killed, and advocated the need for an intervention strategy aimed particularly at friends and acquaintances of those who are killed or injured.

Research on both adults (Maes, Mylle, Delmeire & Janca, 2001) and adolescents (Bolton, O'Ryan, Udwin, Boyle &

Yule, 2000) has documented high rates of comorbid anxiety and depression in persons with PTSD. The relationship between PTSD and these comorbid conditions is complex, however, as PTSD may have a causal role in the development of the comorbid condition, or the existence of a comorbid condition may increase the person's vulnerability to the development of PTSD after exposure to trauma.

There is mounting evidence that girls report more reactions following death and trauma than boys do (Balmer, 1992, reported in Fleming & Balmer, 1996; Bolton *et al.*, 2000; Burke, Moccia, Borus & Burns, 1986; Curle & Williams, 1996; Dyregrov, Matthiesen, Kristoffersen & Mitchell, 1994; Dyregrov, Gjestad, Bie Wikander & Vigerust, 1999; Giaconia *et al.*, 1995; Green *et al.*, 1991; Khoury *et al.*, 1997; Vernberg, La Greca, Silverman & Prinstein, 1996). Higher rates of PTSD in women than men has been found to be a function of higher probability of PTSD development in women, not the prevalence or type of exposure (Breslau, Davis, Andreski, Peterson & Schultz, 1997), a finding supported in a study of older adolescents (Giaconia *et al.*, 1995).

This article focuses on the dramatic discothèque fire described above and addresses the following hypotheses:

1. Such an event will be associated with depressive or posttraumatic stress reactions in students throughout the city.
2. Reactions will differ depending on psychological "closeness" to the fire or the victims.
3. Girls are expected to evidence higher scores than boys on measures of depression and posttraumatic stress.

METHOD

Sample

Out of a total of 672 students enrolled in the study classes, 569 students were present at school on the day the study took place and answered the questionnaire (a response rate of 85%), 265 girls and 298 boys (six students had failed to indicate their gender). Absence was primarily due to illness, but some had left the school since the class lists last were updated, and still others were having lessons separate from their class. They were aged between 13 and 19, with a mean of 15.4 years. They attended junior and senior high school. Sixty-nine percent of the children were born in Sweden, while 31% had immigrant backgrounds.

Questionnaire and inventories

The first part of the questionnaire concerned a few demographic questions, and questions regarding activities at the school following the disaster, and about support from the school, family and friends. Students were asked to state how well they knew the injured and dead, their closeness to the fire, and how they learned about the event. The questions were partly based on the study by McNeil, Silliman and Swihart (1991), and that by Dyregrov *et al.* (1999). The last part of the questionnaire consisted of two inventories.

The Impact of Event Scale (IES) (Horowitz, Wilner & Alvarez, 1979) was used to assess the degree of intrusive thoughts and

Table 1. Total scores and gender differences on the Birlleson Depression Self-Rating Scale (DSRS) and the Impact of Event Scale (IES)

	Number of girls/boys	Total <i>M</i> (<i>SD</i>)	Girls <i>M</i> (<i>SD</i>)	Boys <i>M</i> (<i>SD</i>)	<i>t</i>
DSRS	255/283	9.7 (5.5)	10.8 (5.6)	8.5 (5.0)	4.95***
IES Total	263/282	10.1 (9.1)	25.6 (17.6)	18.7 (16.6)	4.69**
IES Intrusion	263/282	11.9 (9.7)	12.0 (9.4)	8.4 (8.5)	4.75**
IES Avoidance	264/282	22.0 (17.4)	13.6 (9.7)	10.3 (9.4)	4.05**

Note: ** $p < 0.000004$, *** $p < 0.000002$.

images (IES-I) and the degree of avoidance of thoughts and reminders of the event (IES-A). This inventory consists of 15 items with four answer categories, 0 = Not at all, 1 = Rarely, 3 = Sometimes and 5 = Often. This scale is one of the most widely used scales to measure posttraumatic distress following critical events (Paton, 1990). Cronbach's alpha was 0.89 for IES-I, 0.85 for IES-A and 0.92 for IES-Total. For the IES, the clinical cut-off point is usually set at 30, with those who score above 30 comprising those at high risk for having PTSD (Yule, 1992, 1998). However, Stallard and Law (1993), Yule and Udwin (1991) and Lundin (personal correspondence, 1997) have used 40 as a cut-off point. A cut-off score of 35 has been found to correctly identify 89% of those with diagnosable PTSD, and this cut-off level will be used in this study (Neal *et al.*, 1994).

The Birlleson Depression Self-Rating Scale (DSRS) (Birlleson, 1981) was used to assess the degree of depression. This inventory consists of 25 items with three answer categories, 0 = Never, 1 = Sometimes and 2 = Most of the time. Cronbach's alpha for the DSRS was 0.81. Birlleson (1981) suggested that the clinical cut-off point for depression should be set at 15.

Procedure

The study was approved by the National Agency for Education and questionnaires were administered in the classroom at different schools in May 1999. Six junior and five senior high schools representing all different city regions were represented by two classes from each school at junior level and one from each school at senior level (17 classes in all). On the junior level, the aim was to have 50 students from each school; on the senior level, the aim was to have 50 students from each year, level 1 and 2. As classes varied in size, the number of classes from each school varied. The principals at each school were responsible for the distribution of the questionnaires to the class teachers. The principals were informed about the rationale behind the study, that is, learning more about adolescents' reactions and how they perceived the help they received, in order to plan the continuing support in the best possible way. The principals were informed through letters, e-mail and by telephone. At the Göteborg City Education Authority, one of the authors of the study (A-MF) was present to answer questions about the study. The principal of each school decided whether to inform parents about the study. An information letter was made available to the principal for this purpose.

The students were informed that the rationale behind the study was to learn more about adolescents' reactions and how they perceived the help they received, in order to plan the continuing support in the best possible way. The students answered the questionnaire individually and anonymously during one lesson. At least three adults (teachers and support personnel) were present in each class to provide support if any reactions arose and to answer any questions, but they did not in any way lead the students in how to answer the questions. Some students not present on the day the questionnaire was administered were offered an opportunity to fill them in later, with support personnel at hand.

RESULTS

Relation to the fire

Most students (41%) learned about the fire through television or radio, or through their parents telling them (26%). Some heard about it through friends (11%) or through others (9%), while 5% read about it in the papers and 4% were informed through other sources of information. Twenty-two (4%) were present at the scene of the fire.

A fifth of the students (20%) knew none of the dead or injured. Nineteen percent had best friends who lost one or more of their best friends, while 44% had lost or had one or more of their own friends injured. Only 2% of the sample experienced the loss or injury of some of their family. Fourteen percent (14%) had some other relationship to a victim.

General scores on the inventories

Table 1 lists the mean scores on the DSRS and the IES. Nineteen percent scored above the clinical cut-off point of 15 on the DSRS. A little under a third of the students (27%) scored above the recommended clinical cut-off point of 35 on the IES. Pearson product-moment correlations between the DSRS and the IES scores revealed a statistically significant relationship ($r = 0.54$, $p < 0.05$). For the subscales, more depression was paralleled by more intrusion ($r = 0.56$, $p < 0.05$), and avoidance ($r = 0.54$, $p < 0.05$). Using Horowitz's (1982) criteria, 20% evidenced high distress, 28% medium distress and 52% low distress on the IES intrusion subscale. For avoidance, the percentages were 27, 29 and 44 for high, medium and low distress.

Closeness to the victims and scores

The students were asked to rate how well they knew any of the victims. The scores on the IES in relation to their closeness to the victims are reported in Table 2. Those who knew none of the injured or deceased are listed as "distant"; those who reported that some of their best friends had lost one or more of their best friends are listed as "fairly distant"; those who reported that some of their best friends were badly injured or died are listed as "close"; and lastly those who reported that one or more of their own family died are listed as "very close".

Table 2 show that the mean scores increase as the level of closeness increases, reflecting more depressive symptoms and

Table 2. Mean scores and SD (in parentheses) for DSRS and IES (with subscales) in relation to how well subjects knew victims^a

	Distant	Fairly distant	Close	Very close
DSRS	7.7 (4.0)	9.0 (5.0)	11.0 (5.8)	14.0 (6.4)
IES Intrusion	3.7 (5.4)	7.9 (7.1)	14.3 (9.2)	16.5 (10.6)
IES Avoidance	6.0 (7.5)	10.8 (8.9)	15.5 (9.5)	19.5 (12.2)
IES Total	9.7 (11.6)	18.7 (14.8)	29.8 (16.9)	36.1 (20.0)

Note: ^a Number of respondents: distant, $n = 104$ – 105 ; fairly distant, $n = 98$; close, $n = 229$ – 233 ; very close, $n = 10$ – 11 ; 77–78 persons checked a category of “other alternatives”.

more intrusion and avoidance as their personal closeness to those injured or killed in the fire increases. Girls reported more closeness than boys, $F(1, 535) = 13.58$, $p < 0.01$.

The fire happened to a group with a very mixed cultural background. A t -test was performed to see whether there were any differences between those who were Swedish born and those born outside Sweden. The t -tests for both the DSRS and IES (with its subscales) showed that those born outside Sweden had significantly higher scores than those born in Sweden (for brevity only DSRS and IES total are reported here: DSRS, $t = 7.0$, d.f. = 542, $p < 0.001$; IES total, $t = 9.6$, d.f. = 548, $p < 0.001$). As the people present at the fire had a multicultural background, tests were undertaken to see whether this relationship held up with “closeness” as a covariate. It did, probably reflecting that many of the young people with a non-Swedish background had experienced trauma before the fire (many of these young people have fled from war).

Exposure to the fire

Twenty-two of the adolescents were present inside or outside the discothèque when the fire started. A comparison of these 22 with the rest of the sample showed them to have significantly higher depression scores ($t = 3.89$, d.f. = 521, $p < 0.001$) and IES scores (IES total, $t = 5.67$, d.f. = 527, $p < 0.001$; IES intrusion, $t = 5.99$, d.f. = 527, $p < 0.001$; IES avoidance, $t = 4.53$, d.f. = 528, $p < 0.001$) than those not present at the fire.

Gender differences

The scores for the two genders were compared (see Table 1). Girls were significantly more depressed and evidenced higher scores than boys on IES total score as well as on the IES subscales. Analyses of variance showed that girls had talked significantly more with their friends, $F(1/554) = 9.57$, $p < 0.01$, and their parents, $F(1/555) = 13.18$, $p < 0.001$, than boys had. Girls also significantly more than boys had close friends in whom they could confide and whom they found to be of great help following the fire, $F(1, 556) = 38.48$, $p < 0.001$. More girls than boys scored above the cut-off score (> 15)

on the DSRS (23% vs. 15%) and on the IES (> 35) (33% vs. 22%). More than half the girls (54%) wished that teachers had talked more about the fire, compared with 38% of the boys, $F(1/535) = 14.56$, $p < 0.001$. Although there were no differences between boys and girls regarding having received enough information about the fire in general, boys perceived the school as not having provided them with enough information regarding usual reactions during and following a crisis situation, $F(1/549) = 5.11$, $p < 0.05$.

Predicting reactions

Multiple regression (forward stepwise) was used to analyze the relationship between the dependent variables – IES intrusion, IES avoidance and DSRS – and the following independent variables:

1. gender,
2. place of birth (Sweden – outside of Sweden),
3. psychological distance to the victims (knowledge, friendship or family relation),
4. talking with friends about the fire,
5. having a friend to confide in,
6. talking with parents.

In addition, three new variables were constructed. The first variable, termed “rituals”, was constructed from variables where the students acknowledged participation in rituals as helpful following an event such as the fire. The second one, termed “cognitive coping”, was made up of variables such as writing about the event and using time to think about the event. The third one, termed “communication”, concerns attitudes to talking with others. Variables that had no significant effect were removed step by step. The results from the tolerance levels in the multiple regression analysis indicated a low degree of colinearity (range 0.63 to 0.94).

The first dependent variable studied was IES intrusion. The result of the regression analysis is presented in Table 3. The included variables explained 43% of the variance in intrusion. Adolescents with the highest intrusion scores were those born outside Sweden, who had confided in a close friend, who described a close psychological relationship to the victims, and who were female. Higher intrusion scores were also found among those who had talked much with their friends and their parents about the fire, and those who found that rituals and use of cognitive coping were of little help and made things worse. The beta coefficients indicate that having confided in a close friend and reporting a close psychological relationship to the victims had the strongest influence on intrusion.

Regression analysis with avoidance as the dependent variable resulted in seven significant independent variables (see Table 4). The included variables explained 38% of the variance in avoidance. Adolescents with the highest avoidance scores were those born outside Sweden, who had

Table 3. Multiple regression with IES intrusion as the dependent variable

Variables	Intrusion (correlation with dependent variable)	Regression coefficient, <i>B</i>	β coefficient	Semipartial correlation
Gender	-0.21	-1.81	-0.10	-0.10
Place of birth	0.36	3.45	0.18	0.17
Psychological closeness	0.50	2.41	0.24	0.20
Talking with friends	-0.37	-0.79	-0.10	-0.09
Having confided in a close friend	-0.54	-2.57	-0.28	-0.22
Talking with parents	-0.34	-0.72	-0.10	-0.09
Positive towards use of rituals	0.00	0.30	0.09	0.09
Intercept		5.56		
$R^2 = 0.43$ $F(7/370) = 39.72, p < 0.0001$				

Note: All regression parameters were statistically significant at $p < 0.05$.

Table 4. Multiple regression with IES avoidance as the dependent variable

Variables	Avoidance (correlation with dependent variable)	Regression coefficient, <i>B</i>	β coefficient	Semipartial correlation
Gender	-0.20	-3.73	-0.16	-0.15
Place of birth	0.41	5.69	0.25	0.23
Psychological closeness	0.42	2.23	0.20	0.17
Having confided in a close friend	-0.44	-2.15	-0.21	-0.17
Talking with parents	-0.28	-0.75	-0.09	-0.09
Positive towards use of rituals	0.07	0.36	0.10	0.09
Use of cognitive coping	0.21	0.61	0.15	0.13
Intercept		2.17		
$R^2 = 0.38$ $F(7/370) = 32.51, p < 0.0001$				

Note: All regression parameters were statistically significant at $p < 0.05$.

Table 5. Multiple regression with DSRS (depression) as the dependent variable

Variables	Depression (correlation with dependent variable)	Regression coefficient, <i>B</i>	β coefficient	Semipartial correlation
Gender	-0.20	-2.69	-0.25	-0.24
Place of birth	0.29	2.66	0.23	0.22
Psychological closeness	0.27	1.10	0.18	0.17
Negative towards open communication	0.22	1.30	0.25	-0.24
Intercept		3.21		
$R^2 = 0.22$ $F(4/369) = 25.95, p < 0.0001$				

Note: All regression parameters were statistically significant at $p < 0.02$.

confided in a close friend, who described a close psychological relationship to the victims, and who were female. Higher avoidance scores were also found among those who had talked much with their parents about the fire, and among those who found that rituals were of little help and made things worse. The beta coefficients indicate that place of birth had the strongest influence on avoidance, followed by

having confided in a close friend and having a close psychological relationship to the victims.

Regression analysis with depression (DSRS) as the dependent variable resulted in four significant independent variables (see Table 5). The included variables explained 22% of the variance in depression. Adolescents with the highest depression scores were females, those born outside Sweden,

those who described a close psychological relationship to the victims, and those who found that open communication made things worse. The beta coefficients indicate that being female and being negative towards communication had the strongest influence on depression, but the other two variables had similar beta coefficients.

DISCUSSION

No formal diagnostic interview was undertaken and there is no corroborative information from parents or teachers. The study addresses trauma and depressive reactions as measured by a few instruments on only one occasion following the disaster, and suffers from the same limitations as other cross-sectional studies. It does not address changes that have taken place prior to the first seven months in the recovery processes, nor does it encompass the dynamic process that takes place over time.

Subjectively, the students in this sample evidenced fairly strong and intense posttraumatic stress reactions to this fire, thus partly supporting hypothesis 1. Most of them had reacted with shock and a sense of unreality when it happened. Traumatic reactions in the form of intrusion and avoidance, as measured by the IES, were common at the measuring point, with a little under one-third of the group evidencing scores reflecting high levels of posttraumatic stress. Using the cut-off levels suggested by Neal *et al.* (1994), they score at a level indicative of a posttraumatic stress disorder.

The depression scores were not elevated in a similar manner. The Birleson scale does not tap grief in the manner as the Pynoos grief scale (Pynoos, Nader, Frederick, Gonda & Stuber, 1987) or the Hogan Grief Inventory (Hogan, 1990), and it is not possible to know how many of the students were grieving. Compared with normative data (see Ivarsson, 1998) on the DSRS from comparable age groups of Swedish children from the same city (Gothenburg), both girls and boys scored higher following the fire (normative *M* for girls = 7.8 vs. 10.8 following the fire, and normative *M* for boys 6.1 vs. 8.5 following the fire). The results do indicate that the fire group primarily responded with an elevation in the posttraumatic area, and less with depressive reactions.

The scores on the IES indicate that the group in general experienced a relatively high degree of intrusive images and thoughts following the fire. Avoidance levels were somewhat higher than intrusion levels, indicating a cognitive struggle to keep the disaster out of their mind. The high avoidance level might also reflect a process where the group at this time (seven months after the fire) used avoidance strategies to regulate the intrusive images and thoughts. The mean IES levels were lower than those of adolescents surviving the sinking of a cruise ship (Yule & Udwin, 1991) and adolescents surviving a minibus accident (Stallard & Law, 1993).

In previous studies the tendency to suppress thoughts and feelings has been associated with later PTSD (Aaron, Zaglul

& Emery, 1999; Warda & Bryant, 1998). Lonigan, Anthony and Shannon (1998) have found that children reporting symptoms associated with behavioral and emotional avoidance were the most likely to experience a severe posttraumatic reaction, particularly when these symptoms were combined with symptoms associated with re-experiencing phenomena. Other studies also point to unsuccessful avoidance activity as a characteristic of chronic emotional processing (Joseph *et al.*, 1996), often leading to more intrusive thoughts and imagery than in those who allow themselves to remember and process their experience (Aaron *et al.*, 1999). The high level of avoidance found among the students in this study may therefore warrant attention, as it may be associated with suffering over time.

Previous studies have shown that PTSD symptoms in general are associated with the level of exposure to the traumatic event (Lonigan *et al.*, 1991; Tyano *et al.*, 1996). This study shows that both traumatic reactions and depression increase with the closeness to those dead or injured in a disaster, supporting hypothesis 2, and corroborating Pynoos, Frederick *et al.* (1987). It is not only the level of physical threat or the exposure to strong sensory impressions that lead to a form of dose relationship to the traumatic reactions, but also the "psychological" closeness to those directly involved in the disaster. The importance of this variable is emphasized by its importance in all three multiple regression analyses. It is meaningful to look at a form of subjective "closeness hierarchy" following a disaster of this magnitude. By broadening one's focus from direct exposure to emotional exposure in the form of the "felt" distance to those involved, people in need of more follow-up can be identified.

In view of the fact that many of the students in this sample personally did not know anyone who died or survived the fire, the level of depression and traumatic reactions is surprisingly high. It seems evident that a disaster of this size in some ways is affecting all young people in the same age range as those who were present at the fire. The extensive media coverage made this an event that almost every student could identify with and share in, an event that was the subject of conversation among children, adolescents and adults alike. The media were on the scene within minutes and for days news stories described the tragedy and the ensuing reactions in minute detail. By being exposed to the extensive loss and tragedy through the media or having friends and acquaintances who were more directly affected by the fire, other, more distant adolescents were "exposed" too. The situation created a form of psychological closeness and the term "distant trauma" or "trauma by identification" or a form of emotional contagion may describe the situation for those who developed posttraumatic reactions. Pfefferbaum and Pfefferbaum (1998) have used the term "community contamination" to describe the wide-reaching impact that traumatic events can have on entire communities, and contagion may account for the magnitude of distress evidenced by so many.

The "contagion" hypothesis may further be supported by the fact that the variables "having talked much with their friends and parents" and "having confided in a close friend" held up in the multiple regression analyses as being related to elevated scores on the IES and DSRS.

As a majority of the direct victims of the fire had a non-Swedish family or origin, we may expect that those not born in Sweden would feel somewhat more "psychologically close" than would the Swedish born. This conclusion was supported by analyses. However, the raised depressive levels and higher IES scores of non-Swedish adolescents may also reflect that many of these young people had experienced trauma before leaving their country of origin to come and live as refugees in Sweden, and a more difficult life situation in Sweden as exiles. Without good measurement of levels of traumatization prior to the fire, it is difficult to draw firm conclusions.

Another factor that could explain the high level of distress experienced by so many is the fact that going to dances at discothèques is among the activities almost all young people take part in. They socialize, meet friends, start to date and relax from their schoolwork by going out to dances, movies and discothèques. They easily can identify with the victims and "know" that this could have happened to them. Going to a discothèque suddenly changed from an activity filled with fun and excitement to an activity that meant fear and apprehension. If something could happen there, it could happen anywhere.

The significant gender differences on both the DSRS and the IES scale and the results from the multiple regression analyses add to the mounting evidence that females react more to traumatic events than males (Breslau *et al.*, 1991, 1997; Davidson, Hughes, Blazer & George, 1991; Dyregrov, Gjestad *et al.*, 1999; Helzer, Robins & McEvoy, 1987; Kessler, Sonnega, Bromet, Hughes & Nelson, 1995), and supports hypothesis 3. Previous studies have indicated that adolescent girls define themselves through connections and interpersonal ties, while boys seek self-definition through separateness and independence (Douvan & Alderson, 1966; McDermott *et al.*, 1983). The fact that females are likely to experience more concern over other's distress than males (Trobst, Collins & Embree, 1994), and the consistent finding that women have relatively high levels of dispositional empathy in comparison with men (Eisenberg & Lennon, 1983), may partly explain why girls evidenced more reactions both on the IES and on the DSRS, and why they perceived more closeness to the victims. More girls than boys also reported the wish for more discussion in the class, a finding that may implicate gender-differentiated responses in the follow-up.

Implications for intervention

The level of reactions more than half a year following the disaster should lead teachers and support personnel to be well prepared to respond to such events, not only imme-

diately but over time. The intensity and duration of traumatic distress following a disaster may be greater than most teachers and support staff imagine.

Based on the results from the follow-up at seven months, it seems likely that many students would have benefitted from more mental health assistance over time. However, traditional psychiatric services were not sought out to a large degree: many adolescents came for only one or a few visits (Wiberg & Broberg, 2001). New ways of meeting the needs of these adolescents have to be established. Outreach models using more activity-based methods may be a way of doing so. In the summer after the fire, summer camps were arranged by the city of Göteborg, with fire rescue personnel participating in each of them. In these camps, activities like canoeing, swimming and tent building were used to create a "meeting room" for adolescents. During the activities the adolescents could talk about their traumas and losses.

In summary, some of the important clinical implications from this study worth considering when helping following a disaster are as follows.

1. For students who directly or indirectly are exposed to a disaster of this magnitude, follow-up may be needed for more than the first month after the event. Both depressive and traumatic reactions may persist over time.
2. Particular attention should be given to those who perceive themselves to be "psychologically close" to the victims of the disaster, as suggested by Pynoos, Frederick *et al.* (1987). Grief or trauma groups would allow for continued help in this respect (Lohnes & Kalter, 1994; Quarmby, 1993; Tonkins, 1996).
3. Having a detailed crisis contingency plan in place and activated shortly following a disaster situation will increase the chance of securing good follow-up for affected groups. School management need to validate students' reactions over time.
4. Teaching and support staff need to be aware of possible differences between the two genders regarding how they experience and react to such events and how they seek support from friends, family and others following such losses.

NOTES

¹ The description of the event is based on the keynote presentation that Per Hassling of the Fire/Rescue Department of Göteborg city made at the Fifth World Congress on Stress, Trauma and Coping in the Emergency Services Professions, Baltimore, April 1999, entitled "Disco death trap in Sweden".

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Received 17 August 2001, accepted 12 April 2002